The role of skin and its appendages in the assessment of the newborns maturity

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The process of fetal maturing strongly depends on gestational age. The maturity of a newborn, expressed as gestational age, can be determined by birth weight and length or doing a "maturity scoring." Like the pediatrician also the obstetrician often needs the diagnosis of fetal maturity, but in contrast to the pediatrician he needs it before the baby is born to be able to make a precise decision wether to suppress uterine contractions - in cases of prematurity - or in contrary, to induce labor in a case of fetal dysmaturity. One of the organs best reflecting the state of maturity and also most easy accessable to antepartum diagnosis is the skin, and one of the most striking changes within a short time near term is sloughing of vernix caseosa. Quantity and location of vernix caseosa are relevant indices of maturity, and I wonder, why the well known scores for checking newborn are lacking these criteria. This fact is all the more to regret, as sloughing of vernix caseosa - and thus the actual vernix state - is correlated to changes of amniotic fluid - turbidity, amount of sedimentable vernix and cytological changes of the sediment - allowing reliable ante partum estimation of fetal maturity. An other point of discussion, especially for an obstetrician with special interest in the various problems of fetal intrapartum risk in placental dysfunction is the fact, that there is no strict differentiation between those criteria of a maturity score, which are more related to gestational age like skin colour and opacity, state of hairs of length of nails and those more related to placental function, like desquamation of epidermis, loss of turgor and reduction of subcutaneous fat. There is to be examinated, too, if formation, depth and extent of plantar creases is more dependent from duration of pregnancy or from placental function.
In our clinic a prospective study has been started to analyze the various criteria of neonatal maturity - especially of the skin and its appendages - their interactions and their association to amniotic fluid findings. In each case the vernix state of the newborn is checked according to ZABKAR (5) at the back, the chest and abdomen, the extremities and in the great body creases: the total score gives 0-12 points (see Fig. 1). A

SCORING	0 TOTAL COVERED	1 SOME AREAS OF CLEAR SKIN	2 LITTLE VERNIX	3 NO VERNIX
BACK				
CHEST AND ABDOMEN				
EXTREMITIES				
GREAT CREASES				

Fig. 1

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specimen of vernix is prepared for cytological examination after HARRIS-SHORR staining. In each case the maturity is determined by somatic criteria - according to FARR et al., and in addition the length of the nails of fingers and of the toes is scored and also the desquamation of epidermis and turgor and state of subcutaneous fat tissue (2). In all cases a specimen of amniotic fluid is examined: turbidity (3), macro-score (4), amount of sediment after 2o min. centrifugation at 45oo rpm, and cytological examination (1). 8o cases are not enough to allow multifactorial analysis. But we can see that there is no correlation between the quantitatively differentiated cytological findings in the amniotic fluid and those of the vernix adherent to the skin, the latter beeing not influenced by duration of pregnancy or fetal maturity. The findings of vernix cytology didn't show any correlation to any other criteria of fetal maturity or amniotic liquid findings. One other fact seems to be sure: depth and extent of plantar creases is more strongly associated to neonatal dysmaturity (se Fig. 2) than to the gestational age depending nail-score (= 21.4o4 in a 3x4 contingency table). The dysmaturity score is strongly associated to the neonatal vernix-score (= 29.o3, df. 1), and we know the high contingency of the latter to amniotic liquid findings. Thus our first results with multifactorial maturity scoring encourages to further investigations. We hope, that we will be able to make precise diagnosis of neonatal maturity ante partum, to avoid birth of premature and of dysmature children.

Fig. 2

	PLANTAR CREASES	2	1	0
SKIN-DESQUAMATION	OTHER REGIONS	13	4	0
	HANDS OR FEET	3	3	1
	NONE	3	21	34

82

$X^2_4 = 43{,}667$

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